U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Partula langfordi* (Kondo 1970)

COMMON NAME: Langford's tree snail; akaleha

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: September 2005

STATUS/ACTION:

____ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

____ New candidate

_X_ Continuing candidate

____ Non-petitioned

_X_ Petitioned - Date petition received: May 11, 2004

____ 90-day positive - FR date:

__X__ 12-month warranted but precluded - FR date: May 11, 2005

__N_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions. During the past 12 months, most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov

____ Listing priority change

Former LP: ____

New LP: ____

Date when the species first became a Candidate (as currently defined): November 15, 1994

____ Candidate removal: Former LP: ____

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Snails; Family Partulidae (snail)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Commonwealth of the Northern Mariana Islands (Aguiguan; also known as Agujuan or Goat Island)

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Commonwealth of the Northern Mariana Islands (Aguiguan)

LAND OWNERSHIP
The island of Aguiguan is owned by the Commonwealth of the Northern Mariana Islands.

LEAD REGION CONTACT: Paul Phifer (503) 872-2823, paul_phifer@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Lorena Wada (808) 792-9400, lorena_wada@fws.gov

BIOLOGICAL INFORMATION
Species Description: The biology of the partulid tree snails of the Mariana Islands has not been studied in detail. However, general information on the biology of closely related partulid tree snails have been published and reviewed by Cowie (1992) and the biology of these species are very similar. As with all terrestrial pulmonate snails, the Mariana Islands tree snails are hermaphroditic. In general, partulid snails begin reproducing in less than 12 months and may live up to 5 years. Up to 18 young are produced each year and some species may be self-fertile. While most terrestrial snails lay eggs, the partulid tree snails give birth to fully developed young. The snails are generally nocturnal, living on bushes or trees and feeding on decaying plant material. There are no known natural predators of these snails, although many of these species are currently threatened by alien predators.

Taxonomy: The genus *Partula* has four species found only in the Mariana Islands, and 94 additional species recorded from other Pacific islands. Langford's tree snail (*Partula langfordi*) was first collected by Kondo while working on biological control agents in the early 1950s (Kondo 1970). It is only known from the island of Aguiguan in the Commonwealth of the

Northern Mariana Islands. Kondo's 1970 taxonomic write up is the most recent and accepted taxonomy for this species.

Habitat: The Langford's tree snail prefer cool, shaded forest habitats (Crampton 1925; Cowie 1992; Smith 1995) with high humidity and reduced air movement that might otherwise promote excessive water loss. Crampton (1925) described the habitat requirements of the partulid trees snails of the Mariana Islands as: "a sufficiently high and dense growth to provide shade, to conserve moisture, and to effect the production of a rich humus. Hence the limits to the areas occupied by Partulae are set by the more ultimate ecological conditions which determine the distribution of suitable vegetation." -Crampton (1925) further describes the intact structure of native Mariana forests as having four general levels: the high trees; the shrubs and *Panadanus*; the cycads and taller ferns; and the succulent herbs. He notes that the Mariana Islands partulid tree snails preferentially live on subcanopy vegetation and do not use the high canopy trees. These habitat requirements were common prior to World War II and include coastal strands and lowland and highland forests (Crampton 1925). In 1994, the International Union for Conservation of Nature and Natural Resources- The World Conservation Union's Species Survival Committee Mollusc Specialist Group, Captive Breeding Specialist Group and Pacific Island Land Snail Group held a three day symposium to draft an Action Plan for the Conservation of the Family Partulidae. They determined that the potential range by ecographic zonation for Langford's tree snail was less than 10 square kilometers. They were unable to estimate the area that was considered occupied by the snail.

Historic and Current Range Distribution: The three genera and 123 tree snail species of the family Partulidae are restricted to the high-elevation Pacific islands of Polynesia (excluding Hawaii), Melanesia, and Micronesia (Cowie 1992 and Paulay 1994). The Mariana archipelago historically supported five species of partulid tree snails, and represents the northwestern limit of the geographical range of the Partulidae.

The Langford's tree snail is restricted to the small island of Aguiguan where it occurs sympatrically with the humped tree snail (*Partula gibba*) (Kondo 1970). In 1985, five adult Langford's tree snails were collected from the west end of the island (Smith 1995). In 1992, one live snail was observed on the northwest terrace of the island (Smith 1995). Currently, this is the only known individual of this species. No other surveys have been done and at the present time, this species is considered to be rare throughout its range. .

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. Currently, habitat for this species can still be found on the island of Aguiguan. The remaining habitat is primarily threatened by goats which feed on native plants that the snails are found on and by the invasion of the forest by invasive alien weeds such as *Lantana camara* (West Indian lantana), which also displace native plants the snails are found on.

No conservation efforts are being undertaken to alleviate these threats to this species.

B. Over-utilization for commercial, recreational, scientific, or educational purposes. Over-utilization is not known to be a factor currently affecting any of the partulid tree snails

from the Mariana Islands. Future overutilization of this species is not anticipated.

C. Disease or predation.
Predation by the alien rosy carnivore snail (*Euglandina rosea*) and the alien Manokwar flatworm (*Platydemis manokwari*) is a serious threat to the survival of all four species of partulid tree snails from the Mariana Islands. The predatory rosy carnivore snail is native to the southeastern United States, and was introduced into the Mariana Islands in 1957 by the governments of Guam and the Commonwealth of the Northern Mariana Islands as a biocontrol agent.

The rosy carnivore snail readily feeds on native Pacific island tree snails, including the Partulidae such as those of the Mariana Islands (Tillier and Clarke 1983; Murray *et al*. 1988; Miller 1993) as well as Hawaiian achatinellid tree snails (Hadfield *et al*. 1993). A study of the diet of the rosy carnivore snail on the island of Mauritius in the Indian Ocean showed that this alien predator preferred native snails over the targeted alien giant African snail (Griffiths *et al*. 1993). The rosy carnivore snail represents a significant threat to the survival of native Mariana Islands snails, including the four remaining partulid tree snails: the humped tree snail (*Partula gibba*), the Langford's tree snail (*Partula langfordi*), the Guam tree snail (*Partula radiolata*), and the fragile tree snail (*Samoana fragilis*)..

Predation on native partulid tree snails by the terrestrial Manokwar flatworm is also a threat to the long-term survival of these snails. This voracious snail predator was introduced into Guam in 1978 and has been spread by humans throughout the main Mariana Islands (Eldredge 1988). It is an effective biological control agent for the giant African snail, but has also contributed to the decline of native tree snails, due to its ability to ascend into trees and bushes that support native snails. Areas with populations of the flatworm usually lack partulid tree snails or have declining numbers of snails (Hopper and Smith 1992). In 1992 a survey was conducted where one Langford's tree snail was observed on the leaves of a *Guamia mariannae* plant about 3 m (9ft) above the ground. The shells of both dead Langford's tree snails and humped tree snails "littered the ground" (Smith 1995). In addition, a "dense aggregation" of the Manokwar flatworm was also found in the same area (Smith 1995).

No conservation efforts are being undertaken to alleviate these threats to this species.

D. The inadequacy of existing regulatory mechanisms.
Currently, no formal or informal protection is given to the Langford's tree snail.

E. Other natural or manmade factors affecting its continued existence.
Even if the threats responsible for the decline of this species were controlled, the persistence of existing populations is hampered by the small number of extant populations and the small geographic range of the known populations. This circumstance makes the species more vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in decreased evolutionary potential and ability to cope with environmental change (Lande

1988; Center for Conservation Update 1994). Stochastic physical events such as typhoons and droughts could eliminate the only known population of *Partula langfordi*. This is especially true due to several life-history features of this and all other partulid tree snails (Cowie 1992). Reproductive rates are lower than most terrestrial snails as tree snails do not lay large numbers of eggs but bear one to two live young, which means lower numbers of individuals are added to the population and dispersal is very limited with most individuals remaining in the tree or bush into which they were born. All of these traits make these snails very sensitive to any stochastic event that could lead to a reduction or loss of reproductive individuals.

No conservation efforts are being undertaken to alleviate these threats to this species.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED
There are no additional conservation activities to report.

SUMMARY OF THREATS
The primary threats to this species are loss of habitat and predation from nonnative snails and flatworms, and vulnerability to stochastic events. There are no conservation efforts being implemented to address these threats for this species.

LISTING PRIORITY:

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2 ***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
This species is highly threatened throughout its limited range by habitat destruction and modification and by predation from nonnative predatory snails and flatworms. The small number of individuals and the small number of populations also make this species very susceptible to the negative effects of stochastic events such as typhoons and storms. These

threats occur range-wide. No efforts are being made to control or eradicate nonnative snails or to stop the loss of habitat.

Imminence:

Threats to the Langford's tree snail from habitat loss and predation by nonnative predators are imminent due to the on-going nature of these threats.

Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? yes

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of the Langford's tree snail as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

We conducted literature searches for recent articles on this species and contacted species experts, CNMI Division of Fish and Wildlife, and University of Guam and University of Hawaii researchers regarding the current status of this species. No additional information on the species' status was found. However, the existing data regarding the species' status was verified.

This level of monitoring is appropriate to update the status of the species because a thorough literature search was conducted as well as relevant species experts contacted. Information contained in this assessment form was verified and any updated information incorporated. This species is listed as critically endangered in the International Union for Conservation of Nature and Natural Resources Red Data List database (International Union for Conservation of Nature and Natural Resources database 2004).

List of experts contacted:

Name	Date	Place of Employment
Aubrey Moore	March 03, 2005	University of Guam
Ross Miller	March 03, 2005	University of Guam
Barry Smith	March 03, 2005 & July 11, 2005	University of Guam
Laura Williams	July 11, 2005	CNMI Division of Fish and Wildlife, Saipan
Robert Cowie	July 11, 2005	University of Hawaii

List of databases searched:

Name	Date
International Union for Conservation of Nature and Natural Resources	2004

COORDINATION WITH STATES

We contacted CNMI Division of Fish and Wildlife by email with a request for any information on the species and sent copies of our candidate forms. No response was received.

LITERATURE CITED

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Tillier, S. and B.C. Clarke. 1983. Lutte biologique et destruction du patrimoine genetique: le cas du mollusgues gasteropodes pulmones dans les territoires Francais du Pacifique. Sel. Evol., 15:559-566.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: Acting _____ 11/16/05
Regional Director, Fish and Wildlife Service Date

Concur: _____ August 23, 2006
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: 7/21/05
Conducted by: Lorena Wada, Pacific Islands FWO

Comments:

PIFWO Review
Reviewed by:

Gina Shultz Date: 10/12/05
Assistant Field Supervisor, Endangered Species

Patrick Leonard Date: 10/11/05
Field Supervisor